

Claims

1. A method for the production of a composite yarn comprising at least an elastic yarn covered with at least a covering yarn and for automatic replacement of the spools of elastic yarn, comprising the phases of:
- 5 - feeding the covering yarn in an essentially continuous way along a feed path, through at least a first interlacing jet;
- delivering a first elastic yarn from a first spool through the first interlacing jet;
- coating the first elastic yarn with said covering yarn to form the composite yarn and winding the composite yarn on a cop;
- 10 - arranging a second spool of a second elastic yarn in a stand-by position;
- withholding an initial portion of said second elastic yarn in proximity to said first interlacing jet;
- when delivery of the first elastic yarn is interrupted, replacing the cop of composite yarn with a new tube;
- 15 - releasing said initial portion of the second elastic yarn;
- joining said covering yarn and said second elastic yarn using the first interlacing jet;
- resuming production of the composite yarn covering the second elastic yarn with said covering yarn and winding the composite yarn on said new tube.
- 20 2. Method as claimed in claim 1, wherein: the initial free end of the second elastic yarn is withheld by a retaining member.
3. Method according to claim 2, wherein said initial portion of the second elastic yarn is engaged by a deflecting element; and said deflecting element is controlled to release said initial portion of the second elastic yarn.
- 25 4. Method as claimed in claim 3, wherein said deflecting element withholds said second elastic yarn out of the first interlacing jet, the second elastic yarn being disposed to be inserted automatically into said first interlacing jet when it is released from said deflecting element.
5. Method as claimed in claim 4, wherein said second elastic yarn is
- 30 inserted into the first interlacing jet through the effect of the tension exerted by the retaining member.
6. Method as claimed in claim 1 or 2 or 3, wherein the second elastic yarn is inserted into said first interlacing jet and withheld therein, standing by for interruption of the first elastic yarn.

7. Method as claimed in one or more of the previous claims, wherein said retaining member withholds said initial free end at least partly by suction.

8. Method as claimed in one or more of the previous claims, wherein feed of the second elastic yarn starts before joining to said covering yarn.

5 9. Method as claimed in claim 7 and 8, wherein the second elastic yarn delivered before joining to the covering yarn is sucked by said retaining member.

10 10. Method as claimed in one or more of the previous claims, wherein along their path the covering yarn and the elastic yarn pass through a nip, defined by a pair of rollers downstream of said first interlacing jet.

11. Method as claimed in one or more of the previous claims, wherein along its path the composite yarn passes through a nip defined by a pair of rollers.

15 12. Method as claimed in one or more of the previous claims, wherein said elastic yarn is covered with said covering yarn by means of said first interlacing jet.

20 13. Method as claimed in claim 12, wherein: when delivery of said first elastic yarn is interrupted, said first interlacing jet is temporarily made to stop operating while the covering yarn continues to be fed therethrough; after the second elastic yarn from the second spool starts to be delivered through the first interlacing jet, said first interlacing jet is re-activated to join the second elastic yarn to said covering yarn and resume production of said composite yarn.

25 14. Method as claimed in claim 13, wherein said second elastic yarn is already standing by inside the first interlacing jet when feed of the first elastic yarn is interrupted.

15. Method as claimed in one or more of claims 1 to 11, wherein said elastic yarn is covered with said covering yarn by a second interlacing jet, disposed downstream of the first interlacing jet along the path of the covering yarn.

30 16. Method as claimed in claim 15, wherein said first interlacing jet is temporarily activated to join the covering yarn and the second elastic yarn and subsequently de-activated, while the second interlacing jet remains active at least to produce the composite yarn covering the elastic yarn with the covering yarn.

17. Method as claimed in claim 16, wherein said second interlacing jet is temporarily deactivated between interruption of feed of the first elastic yarn and start of feed of the second elastic yarn.

18. Method as claimed in one or more of claims 15 to 17, wherein
5 when delivery of said first elastic yarn is interrupted, the covering yarn is fed through the first inoperative interlacing jet; after delivery of the second elastic yarn from the second spool starts, the first interlacing jet is temporarily activated to join the second elastic yarn to said covering yarn and subsequently deactivated.

10 19. Method as claimed in claim 12, wherein

- said covering yarn is fed through a first nip between a pair of rollers, at least one of which is driven, and through said first interlacing jet.
- the composite yarn delivered from said first interlacing jet is fed to a second nip between a second pair of rollers;
- 15 - said second pair of rollers has a lower peripheral speed with respect to said first pair of rollers to relax the covering yarn between said second nip and said first nip;
- the elastic yarn is fed by a delivery roller through said first interlacing jet, the delivery roller having a lower delivery speed than the speed of said
20 second pair of rollers, to subject said elastic yarn to a stretching effect between said second nip and said delivery roller.

20. Method as claimed in one or more of the previous claims, wherein said covering yarn is a textured yarn, preferably a multiple filament textured yarn.

25 21. Method as claimed in claim 20, wherein said covering yarn is textured in line upstream of said interlacing jet.

22. Method according to any one of the previous claims, comprising the phases of:

- (a) continuously feeding a covering yarn to said second interlacing jet;
- 30 (b) simultaneously feeding to said second interlacing jet a first elastomer yarn being unwound from a first spool, disposed in a working position, so as to obtain interlacing of said covering yarn with said elastomer yarn;
- (c) withholding the free end of a second elastomer yarn, wound on a second spool, disposed in a stand-by position, in a retaining area;

- (d) detecting interruption of feed of said first elastomer yarn, to control, in appropriate time relationship, transfer of said second spool of elastomer yarn to said working position and transfer of said first spool of elastomer yarn to said stand-by position;
- 5 (e) performing a relative movement of said covering yarn with respect to said second elastomer yarn, in proximity to said retaining area of said free end of the second elastomer yarn, so as to come into contact with said second elastomer yarn;
- (f) associating said second elastomer yarn with said covering yarn using an interlacing jet, simultaneously releasing said free end of the second elastomer yarn, to resume feed of said yarns to said second interlacing jet.
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23. Method as claimed in claim 22, wherein said second elastomer yarn is unwound linearly from said second spool to said retaining area, positioned upstream of said second interlacing jet.

- 15 24. Method as claimed in claim 22, wherein said free end of the second elastomer yarn is withheld in the retaining area by suction means.

25. Method as claimed in claim 22, wherein said covering yarn and said first elastomer yarn are conveyed continuously through said first interlacing jet suitable to perform alternate motion in a direction transverse to the direction of feed of said yarns, to bring said covering yarn into contact with said second elastomer yarn.

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26. A device for the production of a composite yarn formed of at least an elastic yarn covered with at least a covering yarn, comprising in combination: a first interlacing jet; a feed path of said covering yarn and a feed path of said elastic yarn towards said first interlacing jet; supporting means for spools of elastic yarn; winding members to wind the composite yarn on a cop being formed; an interruption device to interrupt feed of the composite yarn to said cop being formed and start winding the composite yarn on a new winding tube; characterized in that: said supporting means for the spools of elastic yarn are

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30 suitable to support at least a first spool of elastic yarn and at least a second spool of elastic yarn; and wherein said device further includes: a retaining member associated with said first interlacing jet to withhold an initial free end of the elastic yarn of said second spool; a sensor to detect interruption of feed of said first elastic yarn to said first interlacing jet; a control to control release of

said initial portion when interruption of feed of the first elastic yarn is detected.

27. Device as claimed in claim 26, characterized in that said retaining member is a suction member.

28. Device according to claim 26 or 27, characterized by a deflecting element arranged to withhold an initial portion of said second elastic yarn during delivery of the first elastic yarn to the first interlacing jet.

29. Device as claimed in claim 28, characterized in that said retaining member and said deflecting element are disposed, with respect to said first interlacing jet, so as to withhold the second elastic yarn out of said interlacing jet, and in that the retaining member is designed and arranged to tension said second elastic yarn causing insertion thereof into said first interlacing jet when the deflecting element releases said second elastic yarn.

30. Device as claimed in one or more of claims 26 to 29, characterized in that said first interlacing jet is designed and controlled to perform covering of the elastic yarn with the covering yarn using an air jet.

31. Device as claimed in claim 30, characterized in that: it comprises a first pair of drawing rollers defining a first nip along the feed path of the covering yarn upstream of said first interlacing jet, and a second pair of drawing rollers defining a second nip, downstream of said first interlacing jet; and wherein said second pair of rollers can be controlled to rotate at a lower peripheral speed than the peripheral speed of said first pair of rollers.

32. Device as claimed in claim 31, characterized in that it comprises a delivery roller to deliver the elastic yarn, the delivery speed of which is lower than the peripheral speed of the rollers of said second pair.

33. Device as claimed in one or more of claims 28, 30, 31 and 32, characterized in that said retaining member and said deflecting element are disposed, with respect to said first interlacing jet, so as to withhold the second elastic yarn inside said first interlacing jet.

34. Device as claimed in one or more of claims 26, 27, 28, 29, and 33, characterized in that disposed downstream of said first interlacing jet is a second interlacing jet, to which the elastic yarn and the covering yarn are fed and which performs covering of the elastic yarn with the covering yarn.

35. Device as claimed in claim 34, characterized in that the first interlacing jet is controlled to be activated only temporarily to join the second

elastic yarn to the covering yarn.

36. Device as claimed in claim 34 or 35, characterized in that disposed downstream of said second interlacing jet is a third pair of drawing rollers, defining a nip through which the composite yarn delivered from the second interlacing jet passes.

37. Device as claimed in one or more of claims 26 to 36, characterized in that it comprises a texturing station for said covering yarn.

38. Device as claimed in one or more of claims 26 to 37, characterized in that said supporting means are produced to withhold said first spool in a working position and said second spool in a standby position and to remove the first spool from said working position and transfer the second spool from the standby position to the working position.

39. Device as claimed in one or more of claims 26 to 38, characterized in that said supporting means of the first and of the second spool of elastic yarn are controlled so as to start a replacement cycle of the first spool of elastic yarn with the second spool of elastic yarn following interruption of feed of the first elastic yarn.

40. Device as claimed in claim 39, characterized in that said sensor detects the end of the elastic yarn of said first spool.

41. Device as claimed in one or more of claims 26 to 40, characterized in that said first interlacing jet is movable to cause the second elastic yarn to enter said first interlacing jet.

42. Device as claimed in claim 41, characterized in that said first interlacing jet is movable in a direction transverse to the direction of feed of said yarns; between a withdrawn position, and a forward position, in which said first interlacing jet is activated to join said second elastomer yarn to said covering yarn.

43. Device as claimed in one or more of claims 26 to 42, characterized in that it comprises a collecting member to collect the covering yarn delivered between interruption of the first elastic yarn and start of delivery of the composite yarn formed with the second elastic yarn.

44. Device as claimed in claim 43, characterized in that said collecting member comprises a suction member.

45. Device as claimed in one or more of claims 26 to 43, characterized

in that an oven is disposed along the path of said covering yarn upstream of said first interlacing jet.